A

Confutation of Atheiſm

FROM THE

Structure and Origin of Human Bodies.

PART II. 2.

A

SERMON

Preached at

St. Mary-le-Bow,

June 6. 1692.

Being the *Fourth* of the Lecture Founded by the Honourable *ROBERT BOYLE*, Eſquire.

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Acts XVII. 27.

That they ſhould ſeek the Lord, if haply they might feel after him, and find him; though he be not far from every one of us: for in him we Live, and Move, and have our Being.

IN the former part of this Enquiry I have examin'd and refuted two Atheiſtical Notions oppoſed to the grand Doctrine of the Text, *That we owe our Living and Being to the power of God:* The one of the *Ariſtotelian* Atheiſts, who, to avoid the difficulties of the firſt production of Mankind, without the intervention of Almighty Wiſdom and Power, will have the Race to have thus continued without beginning by an eternal ſucceſſion of infinite paſt Generations; which Aſſertion hath been detected to be mere nonſenſe, and contradictory to it ſelf: The other of the Aſtrological undertakers, that would raiſe Men like Vegetables out of ſome fat and ſlimy ſoil well digeſted by the kindly heat of the Sun, and impregnated with the influence of the Stars upon ſome remarkable and periodical conjunctions: Which opinion hath been vamp'd up of late by *Cardan* and *Ceſalpinus*,

ſalpinus, and other News-mongers from the Skies; a Pretence as groundleſs and ſilly, as the dreaming Oneirocriticks of *Artemidorus* and *Aſtrampſycus* or the modern Chiromancy & Divinations of Gypſies.

I proceed now to the two remaining Paradoxes of ſuch Sects of Atheiſts, as laying aſide Aſtrology and the unintelligible Influence of Heavenly Bodies more than by their Gravity, and Heat, and Light, do either produce Mankind mechanically and neceſſarily from certain connexions of Natural Cauſes, or more dully and ſupinely, though altogether as reaſonably, reſolve the whole buſineſs into the unaccountable ſhuffles and tumults of Matter, which they call Chance and Accident. But at preſent, I ſhall only take an account of the ſuppoſed production of Humane Bodies by Mechaniſm and Neceſſity.

The Mechanical or Corpuſcular Philoſophy, though peradventure the oldeſt, as well as the beſt in the world, had lain buried for many Ages in contempt and oblivion; till it was happily reſtored and cultivated anew by ſome excellent Wits of the preſent. But it principally owes its re-eſtabliſhment and luſtre, to that Honourable Perſon of ever bleſſed Memory, who hath not only ſhewn its uſefulneſs in Phyſiology above the vulgar Doctrines of real Qualities and Subſtantial Forms;

Forms; but likewiſe its great ſerviceableneſs to Religion it ſelf. And I think it hath been competently proved in a former Diſcourſe, how friendly it is to the Immateriality of Human Souls, and conſequently to the Exiſtence of a Supreme Spiritual Being. And I may have occaſion hereafter to ſhew further, that all the Powers of Mechaniſm are intirely dependent on the Deity, and do afford a ſolid Argument for the Reality of his Nature. So far am I from the apprehenſion of any great feats, that this Mechanical Atheiſt can do againſt Religion. For if we conſider the Phænomena of that material World with a due and ſerious attention, we ſhall plainly perceive, that its preſent frame and conſtitution and the eſtabliſhed Laws of Nature are conſtituted and preſerved by Gravitation alone. That is the powerfull cement, which holds together this magnificent ſtructure of the world; *Which ſtretcheth the North over the empty ſpace, and hangeth the Earth upon Nothing*; if we may transferr the words of *Job* from the firſt and real Cauſe to the ſecondary Agent. Without that the whole Univerſe, if we ſuppoſe an undermin'd power of Motion infuſed into Matter, would have been a confuſed Chaos, without beauty or order, and never ſtable and permanent in any condition. Now it may be proved

Job 26. 7.

proved in its due place, that this Gravity, the great Baſis of all Mechaniſm, is not it ſelf Mechanical; but the immediate *Fiat* and Finger of God, and the Execution of the Divine Law; and and that Bodies have not the power of tending towards a Centre, either from other Bodies or from themſelves: which at once, if it be proved, will undermine and ruine all the Towers and Batteries that the Atheiſts have raiſed againſt Heaven. For if no Compound Body in the viſible world can ſubſiſt and continue without Gravity, and Gravity do immediately flow from a Divine Power and Energy; it will avail them nothing, tho' they ſhould be able to explain all the particular Effects, even the Origination of Animals, by mechanical principles. But however at preſent I will forbear to urge this againſt the Atheiſt. For, though I ſhould allow him, that this Catholick Principle of Gravitation is eſſential to Matter without introducing a God; yet I will defy him to ſhew, how a human body could be at firſt produced naturally, according to the preſent Syſtem of things, and the mechanical affections of Matter.

And becauſe this Atheiſt profeſſeth to believe as much as we; that the firſt production of Mankind was in a quite different manner from the preſent and ordinary method of Nature, and yet affirms

firms nevertheleſs, that That was natural too; which ſeems at the firſt ſight to be little leſs than a contradiction: It ſhould lie upon him to make out, how Matter by undirected Motion could at firſt neceſſarily fall, without ever erring or miſcarrying, into ſuch a curious Formation of human Bodies; a thing that by his own confeſſion it was never able to do ſince, or at leaſt hath not done for ſome thouſands of years: to declare to us what ſhape and contexture Matter then had, which it cannot have now: how it came to be altered by long courſe of time, ſo that living men can no more be produced out of putrefaction in the primary way; and yet the ſpecies of Mankind, that now conſiſts of and is nouriſhed by Matter ſo alter'd, ſhould continue to be the ſame as it was from the beginning. He ſhould undertake to explain to us the firſt ſteps and the whole progreſs of ſuch a formation; at leaſt by way of *Hypotheſis*, how it naturally might have been, thought he did not affirm that it was actually ſo. Whether he hath a new Notion peculiar to himſelf about that Production, or takes up with ſome old one, that is ready at hand: whether that moſt witty Conceit of *Anaximander*, That the firſt Men and all Animals were bred in ſome warm moiſture, incloſed in cruſtaceous skins, as it were various

Plutarch *de Plac. Phil.* lib. 5. c. 19. & *Sympoſ.* lib. 8. c. 8. Cenſorinus *de die Natali* c. 4.

various kinds of Crabfiſh and Lobſters; and ſo they continued, till they had arrived at perfect age; when their ſhelly Priſons growing dry and breaking made way for their liberty: or the no leſs ingenious opinion of the great *Empedocles*; That Mother Earth firſt brought forth vaſt numbers of Legs, and Arms, and Heads, and the other members of the Body ſcatter'd and diſtinct, and all at their full growth; which coming together and cementing (as the pieces of Snakes and Lizards have been ſaid to do, if one cuts them aſunder) and ſo configuring themſelves into human ſhape, made luſty proper men of thirty years age in an inſtant: or rather the divine Doctrine of *Epicurus* and the *Ægyptians*; That there firſt grew up a ſort of Wombs, that had their Roots in the Earth, and attracted thence a kind of Milk for the nouriſhment of the incloſed *Fœtus*; which at the time of maturity broke thro' thoſe Membranes, and ſhifted for themſelves. I ſay, he ought to acquaint us which of theſe he is for, or bring a new explication of his own; and not require *Us* to prove the Negative, That a ſpontaneous production of Mankind, neither warranted by example, nor defended by reaſon, nevertheleſs may not *poſſibly* have been true. This is a very unreaſonable demand, and we might juſtly

Plutarch *de Plac. Phil.* 5.19. Cenſorinus *ibidem.*

Cenſorinus *ibid* Lucret. *l.* 5 Diodorus Siculus *l.* 1. *c.* 2.

ly put him off with ſuch an anſwer as this; That there are ſeveral things, which all men in their wits do disbelieve, and yet none but madmen will go about to diſprove. But to ſhew him how much we endeavour to ſatisfie and oblige him, I will venture once for his ſake to incurr the cenſure of ſome perſons for being elaborately trifling. For with reſpect to the moſt of Mankind, ſuch wretched abſurdities are more wiſely contemn'd than confuted, and to give them a ſerious anſwer, may only make them look more conſiderable.

Firſt then, I take it for granted by him, That there were the ſame Laws of Motion, and the like general Fabrick of the Earth, Sea and Atmoſphere, at the beginning of Mankind, as there are at this day. For if any Laws at firſt were once ſettled and conſtituted; like thoſe of the *Medes* and *Perſians*, they are never to be reverſed. To violate and infringe them, is the ſame as what we call Miracle; and doth not ſound very Philoſophically out of the mouth of an Atheiſt. He muſt allow therefore, That Bodies were endowed with the ſame affections and tendencies then as ever ſince, and that if an *Ax-head* be ſuppoſed to float upon water, which is ſpecifically much lighter than it; it had been ſupernatural at that time, as well as in the days of *Eliſha*. And this is all that I deſire 2 Kings 5. 6.

him to acknowledge at preſent. So that he may admit of thoſe Arguments as valid and concluſive againſt his *Hypotheſis*, that are fairly drawn from the preſent powers of Matter, and the viſible conſtitution of the World.

Now that we may come to the point; All Matter is either Fluid or Solid, in a large acceptation of the words, that they may comprehend even all the middle degrees between extreme Fixedneſs and Coherency, and moſt rapid inteſtine motion of the Particles of the Bodies. Now the moſt cavelling Atheiſt muſt allow, that a ſolid inanimate Body, while it remains in that ſtate, where there is none, or a very ſmall and inconſiderable change of Texture, is wholly incapable of a vital production. So that the firſt human Body, without Parents and without a Creator, if ſuch an one ever was, muſt have naturally been produced in and conſtituted by a Fluid. And becauſe this Atheiſt goes mechanically to work; the univerſal Laws of Fluids muſt have been rigidly obſerved during the whole proceſs of the Formation. Now this is a Catholick Rule of Staticks; That if any Body be bulk for bulk heavier than a Fluid, it will ſink to the bottom of that Fluid; and if lighter, it will float upon it; having part of it ſelf extant, and part immerſed to ſuch a determinate

Archimedes *de Inſidentibus humido*, lib. 1. Stevin *des Elements Hydroſtatiques.*

terminate depth, as that ſo much of the Fluid as is equal in bulk to the immerſed part, be equal in Gravity to the whole. And conſequently if ſeveral portions of one and the ſame Fluid have a different ſpecifick Gravity, the heavier will always (in a free veſſel) be gradually the lower; unleſs violently ſhaken and blended together by external concuſſion. But that cannot be in our preſent caſe. For I am unwilling to affront this Atheiſt ſo much, as to ſuppoſe him to believe, that the firſt organical Body might poſſibly be effected in ſome Fluid portion of Matter, while its Heterogeneous parts were jumbled and confounded together by a Storm, or Hurricane, or Earthquake. To be ſure he will rather have the primitive Man to be produced by a long proceſs in a kind of digeſting *Balneum*, where all the heavier Lees may have time to ſubſide, and a due *Æquilibrium* be maintain'd, not diſturb'd by any ſuch rude and violent ſhogs, that would ruffle and break all the little *Stamina* of the *Embryon*, if it were a making before. Now becauſe all the parts of an undiſtributed Fluid are either of equal Gravity, or gradually placed and ſtoried according to the difference of it; any concretion that can be ſuppoſed to be naturally and mechanically made in ſuch a Fluid, muſt have a like ſtructure of its ſeveral

parts; that is, either be all over of a ſimilar Gravity, or have the more ponderous parts nearer to its Baſis. But there need no more conceſſions than this, to extinguiſh theſe ſuppoſed Firſt-born of Nature in their very formation. For ſuppoſe a Human Body to be a forming in ſuch a Fluid in any imaginable poſture, it will never be reconcileable to this Hydroſtatical Law. There will be always ſomething lighter beneath, and ſomething heavier above; becauſe Bone, or what is then the Stuff and Rudiments of Bone, the heavieſt *in ſpecie*, will be ever in the midſt. Now what can make the heavier Particles of Bone aſcend above the lighter ones of Fleſh, or depreſs theſe below thoſe, againſt the tendency of their own Nature? This would be wholly as miraculous, as the ſwimming of Iron in Water at the command of *Eliſha*: and as impoſſible to be, as that the Lead of an Edifice ſhould naturally and ſpontaneouſly mount up to the Roof, while lighter materials employ themſelves beneath it: or that a Statue, like that in *Nebuchadnezzar*'s Viſion, whoſe head was of fine and moſt ponderous Gold, and his Feet of Iron and Clay, ſhould mechanically erect it ſelf upon them for its Baſis.

Secondly, Becauſe this Atheiſt goes mechanically to work, he will not offer to affirm, That all

all the parts of the *Embryon* could according to his explication be formed at a time. This would be a ſupernatural thing, and an effectual refutation of his own Principles. For the Corpuſcles of Matter having no conſciouſneſs of one anothers acting (at leaſt before or during the Formation; as will be allowed by that very Atheiſt, that Attributes Reaſon and Perception to them when the Formation is finiſhed) they could not conſent and make a compact together, to carry on the work in the ſeveral places at once; and one party of them be forming the Brain, while another is modelling the Heart, and a third delineating the Veins. No, there muſt be, according to Mechaniſm, a ſucceſſive and gradual operation: Some few Particles muſt firſt be united together, and ſo by appoſition and mutual connection ſtill more and more by degrees, till the whole Syſtem be completed: and a Fermentation muſt be excited in ſome aſſignable place, which may expand it ſelf by its Elaſtical power; and break through, where it meets with the weakeſt reſiſtance; and ſo by that ſo ſimple and mechanical action, may excavate all the various Ducts and Ventricles of the Body. This is the only general account, as mean as it appears to be, that this Machin of an Atheiſt can give of that *fearfull and wonderfull* Production.

duction. Now to confute theſe Pretences, *Firſt*, There is that viſible Harmony and Symmetry in a Human Body, ſuch a mutual communication of every veſſel and member of it, as gives an intrinſick evidence; that it was not formed ſucceſſively, and patch'd up by piece-meal. So uniform and ordering a Syſtem with innumerable Motions and Functions, all ſo placed and conſtituted, as never to interfere and claſh one with another, and diſturb the Oeconomy of the whole, muſt needs be aſcribed to an intelligent Artiſt; and to ſuch an Artiſt, as did not begin the matter unprepared and at a venture; and when he was put to a *Nonplus*, pauſe and heſitate, which way he ſhould proceed; but he had firſt in his comprehenſive Intellect a complete *Idea* and Model of the whole Organical Body, before he enter'd upon the Work. But *Secondly*, if they affirm, That mere Matter by its mechanical Affections without any deſign or direction could form the Body by ſteps and degrees; what member then do they pitch upon for the foundation, and cauſe of all the reſt? let them ſhew us the beginning of this Circle; and the firſt Wheel of this perpetual Motion. Did the Blood firſt exiſt, antecedent to the formation of the Heart? But that is to ſet the Effect before the Cauſe: becauſe all the Blood

Blood that we know of, is made in and by the Heart, having the quite different form and qualities of Chyle, before it comes thither. Muſt the Heart then have been formed and conſtituted before the Blood was in being? But here again, the Subſtance of the Heart it ſelf is moſt certainly made and nouriſhed by the Blood, which is conveyed to it by the Coronary Arteries. And thus it is through the whole Syſtem of the Body; every member doth mutually ſuſtain and ſupply one another; and all are coætaneous, becauſe none of them can ſubſiſt alone. But they will ſay, that a little Ferment firſt making a Cavity, which became the left Ventricle of the Heart, did thence further expand it ſelf; and thereby delineate all the Arteries of the Body. Now if ſuch a ſlight and ſorry buſineſs as that, could produce an Organical Body; one might reaſonably expect, that now and then a dead lump of Dough might be leven'd into an Animal: for there a like Ferment makes notable Tumors and Ventricles; beſides ſundry long and ſmall Chanels, which may paſs tolerably well for Arteries and Veins. But I pray, in this ſuppoſed mechanical Formation, when the Ferment was expanded to the extremities of the Arteries, if it ſtill had any elaſtical force remaining, why did it it not go on and break through the

Cartaſius *de Formatione Fœtûs.*

the Receptacle, as other Ferment muſt be allowed to have done at the Mouth and the Noſtrils? There was as yet no membranous Skin formed, that might ſtop and repell it. Or if the force of it was ſpent, and did not wheel about and return; what mechanical cauſe then ſhall we aſſign for the Veins? for this Ferment is there ſuppoſed to have proceeded from the ſmall capillary extremities of them to the Great Vein and the Heart: otherwiſe it had made Valves which would have ſtopp'd its own paſſage. And why did that Ferment, that at firſt diſperſed it ſelf from the great Artery into infinite little ramifications, take a quite contrary method in the making of the Veins, where innumerable little Rivulets have their confluence into the Great Vein, the common chanel of the Blood? Are ſuch oppoſite motions both equally mechanical, when in both caſes the Matter was under the ſame modification? And *again*, When the firſt Ferment is excited, and forms the left Ventricle, if the Fluid Matter be uniform and of a ſimilar texture, and therefore on all ſides equally reſiſt the expanſion; then the Cavity muſt continue one, dilated more and more, 'till the expanſive force and the uniform reſiſtance be reduced to an equality, and ſo nothing at all can be formed by this Ferment, but a ſingle round Bubble.

ble. And moreover this Bubble (if that could make a Heart) by reaſon of its comparative Levity to the Fluid that incloſes it, would neceſſarily aſcend to the top; and conſequently we ſhould never find the Heart in the midſt of the Breaſt. But if the Fluid be ſuppoſed to conſiſt of Heterogeneous Particles, then we cannot conceive how thoſe diſſimilar parts ſhould have a like ſituation in two ſeveral Fluids, when the Ferment begins. So that upon this ſuppoſition there could be no Species of Animals, nor any Similitude between them: One would have its Lungs, where another hath its Liver, and all the other Members præpoſterouſly placed; there could not be a like Configuration of Parts in any two Individuals. And *again*, What is that which determins the Growth of all living Creatures? What Principles of Mechaniſm are ſufficient to explain it? Why do not all Animals continually increaſe in bigneſs during the whole ſpace of their Lives, as it is reported of the Crocodile? What ſets a bound to their Statures and Dimenſions? and if we ſuppoſe a Bound and *Ne plus ultra* to be mechanically fixed, why again ſo great a variety in the Bulk of the ſeveral Kinds? Why alſo ſuch Conſtancy obſerved in that manifold variety? For as ſome of the largeſt Trees have Seeds no bigger or leſs than

ſome diminutive Plants, and yet every Seed is a perfect Plant with Trunk and Branches and Leaves incloſed in a Shell: So the firſt *Embryon* of an Ant is ſuppoſed by inquiſitive Naturaliſts to be as big as that of an Elephant, and to promiſe as fair at its primitive Formation for as ſpacious a Body: which nevertheleſs by an immutable degree can never arrive to the millionth part of the others Bulk. And what modification of the firſt liquid Matter can vary ſo much, as to make one *Embryon* capable of ſo prodigiouſly vaſt augmentation, while another is confined to the minuteneſs of an Inſect? Is not this manifeſtly a Divine Sanction that hath fixed and determin'd the Shape, the Stature, the Appetites, and the Duration of all Creatures in the World? Hither muſt we have recourſe in that great and myſterious Affair of an Organical Formation: And I profeſs that I cannot diſcern one ſtep in the whole, that is agreeable to the natural Laws of Motion. If we conſider the Heart, which is ſuppoſed to be the firſt principle of Motion and Life, and mentally divide it into its conſtituent Parts, its Arteries, and Veins, and Nerves, and Tendons, and Membranes, and the innumerable little Fibres, that theſe ſecondary Parts do conſiſt of; we ſhall find nothing here Singular, but what is in any other Muſcle of the Body. 'Tis only the

Swammerdam *Hiſt. Inſect. p.* 3.

the Site and Poſture of their ſeveral Parts and the Configuration of the whole, that give it the Form and Functions of a Heart. Now why ſhould the firſt ſingle Fibres in the Formation of the Heart be peculiarly drawn in Spiral Lines; when the Fibres of all other Muſcles are made by a tranſverſe rectilinear Motion? What could determine the Fluid Matter into that odd and ſingular Figure, when as yet no other Member is ſuppoſed to be form'd, that might deſign the Orbit of its Courſe? Let Mechaniſm here make an experiment of its Power, and produce a ſpiral and turbinated motion of the whole moved Body without an external Director. When all the Organs are once framed by a ſupernatural and divine Principle, we do willingly admit of Mechaniſm in many Functions of the Body: but that the Organs themſelves ſhould be mechanically formed, we conceive it to be impoſſible and utterly inexplicable. And if any Atheiſt will give a clear and philoſophical account of the things that are here touch'd upon; he may then hear of many more and perhaps more difficult than theſe, which their unfitneſs for a popular Auditory, and the remaining Parts of my Subject, that preſs forward to be treated of, oblige me now to omit.

But as the Atheiſt, when he is put to it to explain, How any Motion of dead Matter can beget Thought and Perception, will endeavour to defend his baffled Impiety with the inſtance of Brutes, which he calls Thinking Machins: ſo will he now alſo appeal from the Arbitration of Reaſon in the Caſe of Animal Productions, to Example and Matter of Fact. He will declame to us about the admirable Structure of the Bodies of Inſects; that they have all the Vital Parts, which the largeſt of Quadrupeds and even Man himſelf can boaſt of; whoſe Fabrick they the rather excell in his opinion, for that very minuteneſs, that makes them contemptible: and that one would be apt to imagin, that theſe elegant and elaborate little Engins were all now propagated by Generation, and at firſt produced by ſome Divine Wiſdom and Power; if we did not find by experience, that they are the eaſie and obvious Products of unintelligent Nature, that ſpontaneouſly and mechanically forms them out of putrefied Carcaſſes and the warm moiſture of the Soil: and yet (which is mightily to his purpoſe) that theſe Inſects, ſo begotten without Parents, have nevertheleſs fit Organs of Generation and Difference of Sex, and can propagate their own kinds, as if themſelves had been born ſo too: and that if Mother Earth

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in this her barrenneſs and decrepitneſs of Age can procreate ſuch ſwarms of curious Engins, which not only themſelves enjoy their portion of Life, but by a moſt wonderfull Inſtinct impart it to many more, and continue their Species: might ſhe not in the flower of her Youth, while ſhe was ſucculent and fertil, have produced Horſes and Elephants and even Mankind it ſelf, the largeſt and perfecteſt Animals, as eaſily as in this parched and ſteril condition ſhe can make a Frog or an Inſect? Thus he thinks, he hath made out from Example and Analogy, that at the Beginning of things every Species of Animals might ſpring mechanically out of the Soil without an intelligent Creator. And indeed there is no one thing in the World, which hath given ſo much Countenance and Shadow of Poſſibility to the Notion of Atheiſm, as this unfortunate miſtake about the æquivocal generation of Inſects: And as the oldeſt remains of Atheiſtical Writings are charged full with that Compariſon; ſo it is the main refuge of thoſe, that in this and the laſt Age have had the Folly and Impudence to appear in ſo wretched a Cauſe.

Now to this laſt Subterfuge of the Mechanical Atheiſts we can occurr ſeveral ways. And at preſent we affirm, *Firſt, ex abundanti,* That though we ſhould allow them the ſpontaneous production

on of ſome minute Animals, yet a like primitive Origination of Mankind could not thence be concluded. Becauſe they firſt tacitly ſuppoſe, that there is an univerſal decay of Moiſture and Fertility in the Earth. And they cannot avoid the neceſſity of ſo doing: For if the Soil be as fruitfull now, as it was in the beginning; why would it not produce Men, and the nobler kinds of Beaſts in our days too, if ever it did ſo? So that if that ſuppoſition be evinced to be erroneous and groundleſs, all the Arguments that they build upon it, will be ſubverted at once. Now what more eaſily refuted, than that old vulgar Aſſertion of an univerſal Drought and Exſiccation of the Earth; As if the Sun could evaporate the leaſt Drop of its Moiſture, ſo that it ſhould never deſcend again, but be attracted and elevated quite out of the Atmoſphere? 'Tis now a matter agreed and allowed by all competent Judges, that every Particle of Matter is endowed with a Principle of Gravity, whereby it would deſcend to the Centre, if it were not repelled upwards by heavier bodies. So that the ſmalleſt Corpuſcle of Vapour, if we ſuppoſe it to be exhaled to the top of the Atmoſphere, thence it muſt come down again, or at leaſt muſt there remain incumbent upon others; for there's either nothing or nothing heavier about it to protrude

trude it any higher, neither can it ſpontaneouſly mount any more againſt the tendency of its nature. And leſt ſome ignorant Atheiſt ſhould ſuſpect, that peradventure there may be no ſuch Top of the Atmoſphere; but that it may be continued on to the Sun or to the indefinite ſpace: he muſt vouchſafe to be inſtructed, That the whole weight of any Column of the Atmoſphere, and likewiſe the Specifick gravity of its Baſis are certainly known by many Experiments: and that by this computation (even making allowance for its gradually larger Expanſion, the higher we go,) the very top of any Pillar of Air is not One hundred miles diſtant from the Surface of the Earth. So that hence it is manifeſt, that the whole Terraqueous Globe with its Atmoſphere cannot naturally have loſt the leaſt Particle of Moiſture, ſince the foundation of the World. But ſtill they may inſiſt, That although the whole Globe cannot be deprived of any of its Moiſture, yet the habitable Earth may have been perpetually the drier, ſeeing it is aſſiduouſly drained and exhauſted by the Seas. But to this we reply, That the very contrary is demonſtrable; That the longer the World ſhall continue, the Moiſter will be the whole Aggregate of the Land. For (to take no notice of the ſupply of its Moiſture by Rains and

and Snow and Dews and Condenſation of Vapours, and perhaps by ſubterraneous paſſages) the tops of Mountains and Hills will be continually waſhed down by the Rains, and the Chanels of Rivers corroded by the Streams; and the Mud that is thereby conveyed into the Sea will raiſe its bottom the higher; and conſequently the declivity of Rivers will be ſo much the leſs; and therefore the Continents will be the leſs drain'd, and will gradually increaſe in Humidity from the firſt period of their Duration to their final Conſummation of all things: if a Divine Power do not interpoſe and change the ſettled courſe and order of Nature.

But let us allow their ſuppoſition, That the Total of the dry Land may have been robbed of ſome of its Moiſture which it had at its firſt Conſtitution: yet ſtill there are ſome parts of the Earth ſufficiently ſoak'd and water'd to produce, if ever, thoſe Senſitive and Locomotive and intelligent Plants. For do not the *Nile*, and the *Niger*, and the *Ganges*, and the *Menam*, make yearly Inundations in our days, as they have formerly done? And are not the Countries ſo overflown ſtill ſituate between the Tropicks under the direct and moſt vigorous Rays of the Sun, the very place where theſe Mechanical Atheiſts lay the Scene

Scene of that great Tranſaction? So that if Mankind had ever ſprung naturally out of the Soil, the Experiment would ſucceed now every year in *Æthiopia* and *Siam*; where are all the requiſite qualifications, that ever have been, for ſuch a production. And *again*, if there hath been ſuch a gradual diminution of the Generative Faculty of the Earth, that it hath dwindled from nobler Animals to puny Mice and Inſects; why was there not the like decay in the production of Vegetables? We ſhould have loſt by this time the whole Species of Oaks and Cedars and the other tall and lofty Sons of the Foreſt, and have found nothing but dwarfiſh Shrubs and creeping Moſs and deſpicable Muſhroms. Or if they deny the preſent ſpontaneous production of larger Plants, and confine the Earth to as Pigmie Births in the Vegetable Kingdom, as they do in the other: yet ſurely in ſuch a ſuppoſed univerſal decay of Nature, even Mankind it ſelf that is now nouriſhed (though not produced) by the Earth, muſt have degenerated in Stature and Strength in every Generation. And yet we have certain demonſtration from *Ægyptian* Mummies, and *Roman* Urns and Rings and Meaſures and Ædifices and many other Antiquities, that Human Stature has not diminiſhed for above Two thouſand years.

Now if the Decay hath not been conſtant and gradual, there hath been no Decay at all; or at leaſt no natural one, nor what may be accounted for by this Mechanical Atheiſt. I conclude therefore, That although we ſhould allow the ſpontaneous production of Inſects; yet no Argument can be deduced from thence for a like Origination of Mankind.

But, *Secondly*, we affirm, That no Inſect or Animal did ever proceed æquivocally from Putrefaction, unleſs in miraculous Caſes, as in *Ægypt* by the Divine Judgments; but all are generated from Parents of their own Kind, Male and Female: a Diſcovery of that great Importance, that perhaps few Inventions of this Age can pretend to equal Uſefulneſs and Merit; and which alone is ſufficient (if the Vices of Men did not captivate their Reaſon) to explode and exterminate rank Atheiſm out of the World. For if all Animals be propagated by Generation from Parents of their own Species, and there be no inſtance in Nature of even a Gnat or a Mite either now or in former Ages ſpontaneouſly produced *de novo*: how came there to be ſuch Animals in Being, and whence could they proceed? There is no need of much ſtudy and deliberation about it: for either they have exiſted eternally by infi-

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nite Succeſſions already gone and paſt, which is in its own Notion abſurd and impoſſible; or their Origin muſt be aſcribed to a Supernatural and Divine Power, that formed and created them. Now to prove our aſſertion about the Seminal production of all living Creatures; that we may not repeat the Reaſons which we have offer'd before againſt the firſt Mechanical Formation of Human Bodies, which are equally valid againſt the ſpontaneous Origin of the minuteſt Inſects; we appeal to Obſervation and Experiment, which carry the ſtrongeſt conviction with them, and make the moſt ſenſible and laſting impreſſions. For whereas it hath been the general Tradition and Belief, that Maggots and Flies breed in putrefied Carcaſſes, and particularly Bees come from Oxen, and Hornets from Horſes, and Scorpions from Crabfiſh, *&c.* all is now found to be Fable and Miſtake. That ſagacious and learned Naturaliſt *Franciſco Redi* made innumerable trials with the putrid Fleſh of all ſorts of Beaſts and Fowls and Fiſhes and Serpents, with corrupted Cheeſe and Herbs and Fruits and even Inſects themſelves: and he conſtantly found that all thoſe Kinds of Putrefaction did only afford a Neſt and Aliment for the Eggs and Young of thoſe Inſects that he admitted to come there; but produced no Ani-

See the former Sermon.

Ἵπποι μὲν σπηκῶν γένεσις, ταῦροι δὲ μελισσῶν.

Nicander. Redi *De generatione inſectorum.*

mal of themſelves by a ſpontaneous Formation. For when he ſuffer'd thoſe things to putrefie in Hermetically ſealed Glaſſes, and Veſſels cloſe cover'd with Paper; and not only ſo, leſt the Excluſion of the Air might be ſuppoſed to hinder the Experiment; but in Veſſels cover'd with fine Lawn, ſo as to admit the Air and keep out the Inſects: no living thing was ever produced there, though he expoſed them to the action of the Sun, in the warm climate of *Florence*, and in the kindeſt ſeaſon of the year. Even Flies cruſh'd and corrupted, when incloſed in ſuch Veſſels, did never procreate a new Fly; though there, if in any caſe, one would have expected that ſucceſs. And when the Veſſels were open, and the Inſects had free acceſs to the Aliment within them, he diligently obſerved, that no other Species were produced, but of ſuch as he ſaw go in and feed and depoſit their Eggs there: which they would readily do in all Putrefaction; even in a mucilage of bruiſed Spiders, where Worms were ſoon hatch'd out of ſuch Eggs, and quickly changed into Flies of the ſame kind with their Parents. And was not that a ſurprizing Transformation indeed, if according to the vulgar opinion thoſe dead and corrupted Spiders ſpontaneouſly changed into Flies? And thus far we are obliged to the diligence

gence of *Redi*: from whence we may conclude, That no dead Fleſh nor Herbs nor other putrefied Bodies, nor any thing that hath not then actually either a Vegetable or Animal Life can produce any Inſect. And if we ſhould allow, as he did, that every Animal and Plant doth naturally breed and nouriſh by its ſubſtance ſome peculiar Inſect: yet the Atheiſt could make no advantage of this Conceſſion as to a like Origination of Mankind. For ſurely, 'tis beyond even an Atheiſt's Credulity and Impudence, to affirm that the firſt Men might proceed out of the Galls and Tumors of Leaves of Trees, as ſome Maggots and Flies are ſuppoſed to do now; or might grow upon Trees, as the ſtory goes about Barnacles; or perhaps might be the Lice of ſome vaſt prodigious Animals, whoſe Species is not now extinct. But although we ſuppoſe him guilty of ſuch an extravagant folly, he will only ſhift the difficulty, and not wholly remove it, for we ſhall ſtill expect an account of the ſpontaneous Formation of thoſe mountainous kind of Animals and Men-bearing Trees. And as to the Worms that are bred in the inteſtines and other inward parts of Living Creatures, their production is not material to our preſent enquiry, till ſome Atheiſt do affirm, that his own Anceſtors had ſuch an Original.

Original. I ſay, if we ſhould allow this conceſſion of *Redi*, it would do no ſervice to our Adverſaries; but even here alſo they are defeated by the happy curioſity of *Malpighi* and others, who obſerved and diſcovered, That each of thoſe Tumors and Excreſcences of Plants, out of which generally iſſues a Fly or a Worm, are at firſt made by ſuch Inſects, which wound the tender buds with a long hollow Trunk, and depoſit an Egg in the hole with a ſharp corroding liquor, which cauſeth a ſwelling in the leaf, and ſo cloſeth the orifice: and within this Tumor the Worm is hatcht and receives its Aliment, till it hath eat its way through. Neither need we recurr to an æquivocal production of Vermin in the *Phthiriaſis* and in *Herod*'s Diſeaſe, who was σκωληκόβρωτος, *eaten of Worms*, or Maggots. Thoſe horrible diſtempers are always accompanied with putrefying Ulcers; and it hath been obſerved by the moſt accurate *Lewenhoeck*, that Lice and Flies, which have a moſt wonderfull inſtinct and acuteneſs of ſenſe to find out convenient places for the hatching and nouriſhment of their young, do mightily endeavour to lay their Eggs upon Sores; and that one will lay above a hundred Eggs, and may naturally increaſe to ſome hundreds of thouſands in a quarter of a year: which gives a full and

Malpighius de Gallis, Swammerdam *de gen. Inſect.* Lewenhoeck. *Epiſtol.*

Acts 12.23.

Continuat. Epiſtol. p. 101.

and ſatisfactory account of the *Phœnomena* of thoſe Diſeaſes. And whereas it is ſaid, *Exod.* 16. *v.* 20. That ſome of the *Iſraelites left of the Manna untill the morning, and it bred worms and ſtank*; which an Atheiſt may make an objection, as either againſt us, or againſt the truth of the Scriptures: I underſtand it no otherwiſe, than that the *Manna* was *fly-blown*. It was then the Month of *October*, which in that Southern Climate, after the preceding Autumnal Rains, doth afford a favourable ſeaſon and copious nutriment for infinite ſwarms of Inſects. Neither do I aſcribe it to a miraculous power, that ſome of the *Manna* ſhould breed Worms, but that all the reſt ſhould be preſerved ſound and untainted. And if any one ſhall rigidly urge the literal expreſſion of *breeding*; he muſt give leave to ſpeak in the language of the Vulgar in common affairs of life. We do now generally believe the *Copernican* Syſtem; yet I ſuppoſe upon ordinary occaſions we ſhall ſtill uſe the popular terms of Sun-riſe and Sun-ſet, and not introduce a new pedantick deſcription of them from the motion of the Earth. And then as to the vulgar opinion, That Frogs are made in the Clouds and brought down by the Rains, it may be thus eaſily refuted: for at that very inſtant, when they are ſuppoſed to deſcend, you may find

find by diſſection not only their Stomachs full of meat, but their inteſtines full of excrement: ſo that they had lurked before in the day-time in holes and buſhes and graſs, and were then invited abroad by the freſhneſs of a Shower. And by this time we may underſtand, what credit and authority thoſe old Stories ought to have about monſtrous productions in *Ægypt* after the Inundation of the *Nile*, of Mice and Frogs and Serpents, half fleſh and half mud; nay of the Legs, and Arms, and other Limbs of Men, & *quicquid Græcia mendax*; altogether as true, as what is ſeriouſly related by *Helmont*, That foul Linen, ſtopt in a veſſel that hath Wheat in it, will in 21 days time turn the Wheat into Mice: which without coujuring one may gueſs to have been the philoſophy and information of ſome Houſewife, who had not ſo carefully cover'd her Wheat, but that the Mice could come at it, and were there taken napping, juſt when they had made an end of their good cheer. Corn is ſo innocent from this calumny of breeding of Mice, that it doth not produce the very Weevils that live in it and conſume it: the whole courſe of whoſe generation and periodical changes hath been curiouſly obſerved and deſcribed by the ingenious *Lewenhoeck*. And moreover, that we may deprive

Helmont. *Imago Ferment.* &c. p. 92. Edit. 1652.

prive the Atheiſt of all hopes and pretenſions of Argument from this baffled opinion of æquivocal Inſects, we will acquaint him from the moſt accurate obſervations of *Swammerdam*, That even the ſuppoſed change of Worms into Flies is no real tranſmutation; but that moſt of thoſe Members, which at laſt become viſible to the Eye, are exiſtent at the beginning, artificially complicated together, and cover'd with Membranes and Tunicles, which are afterwards ſtript off and laid aſide: and all the reſt of that proceſs is no more ſurprizing, than the eruption of Horns in ſome Brutes, or of Teeth and Beard in Men at certain periods of age. And as we have eſtabliſh'd our aſſertion of the ſeminal production of all kinds of Animals; ſo likewiſe we affirm, That the meaneſt Plant cannot be raiſed without ſeed by any formative power reſiding in the Soil. To which aſſertion we are encourag'd, *Firſt*, from the known Seeds of all Vegetables, one or two only excepted, that are left to future diſcovery: which ſeeds by the help of Microſcopes are all found to be real and perfect Plants, with Leaves and Trunk curiouſly folded up and incloſed in the *Cortex*: nay one ſingle grain of Wheat or Barley or Rye, ſhall contain four or five diſtinct Plants under one common Tunicle: a very con-

vincing argument of the Providence and Goodneſs of God; that thoſe Vegetables that were appointed to be the chief ſuſtenance of Mankind, ſhould have that multiplied fœcundity above any others: and *Secondly*, by that famous experiment of *Malpighi*, who a long time incloſed a quantity of Earth in a veſſel, ſecured by a fine cloth from the ſmall imperceptible Seeds of Plants that are blown about with the winds; and had this ſucceſs of his curioſity, to be the firſt happy diſcoverer of this noble and important Truth, That no ſpecies of Plants can be produced out of Earth *de novo*, without a præexiſtent ſeed; and conſequently they were all created and raiſed at the beginning of things by the Almighty Gardener, God bleſſed for ever. And *Laſtly*, as to thoſe various and elegant Shells, that are dug up in Continents and embodied in Stones and Rocks at a vaſt diſtance from any Sea; which this Atheiſt may poſſibly allege for an inſtance of a Plaſtick faculty of Nature: 'tis now generally agreed by the moſt diligent Inquirers about them, That they are no ſportfull productions of the Soil, as was formerly believed, but that all did once belong to real and living Fiſhes; ſeeing that each of them doth exactly reſemble ſome other Shell on the Sea-ſhore, both in its outward lineaments,

and

and inward texture, and ſpecifick gravity, and all other properties: which therefore are ſo far from being ſubſervient to Atheiſts in their audacious attempts againſt God and Religion, that they rather afford an experimental confirmation of the Univerſal Deluge.

And thus we have competently ſhewn, that every Species of living Creatures, every ſmall Inſect, and even the Herbs of the Field give a caſting vote againſt Atheiſm; and declare the neceſſity of a ſupernatural Formation. If the Earth in its firſt conſtitution had been left to its ſelf, what horrid deformity and deſolation had for ever overſpread its face? not one living Inhabitant found on all its ſpacious ſurface; not ſo much as a Worm in the Bowels of it, nor one ſingle Fiſh in the vaſt boſom of the Sea; not a Mantle of Graſs or Moſs, to cover and conceal the nakedneſs of Nature. An eternal Sterility muſt have poſſeſſed the World, where all things had been fixed and faſten'd everlaſtingly with the Adamantin chains of Specifick Gravity; if the Almighty had not ſpoken and ſaid, *Let the Earth bring forth Graſs, the Herb yielding Seed, and the Fruit-tree yielding Fruit after its kind, and it was ſo.* 'Twas God, that then created the firſt ſeminal forms of all Animals and Vegetables, that *commanded the Waters*

Waters to bring forth abundantly, and *the Earth to produce Living Creatures after their kind*; that *made Man in his own image after his own likeneſs:* that by the efficacy of his firſt Bleſſing made *him be fruitfull and multiply and repleniſh the Earth*; by whoſe alone power and conſervation *we all live and move and have our being.*

May the ſame moſt Glorious God of his infinite Mercy grant, that as we *have ſought the Lord, and felt after him, and found him* in theſe works of his Creation; ſo now that *we have known God, we may glorify him as God* both now, and for evermore. *Amen.*

F I N I S.

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